

REMARKS

Careful consideration has been given by the applicants to the Examiner's comments in rejecting the application in response to the previous Office Action, and in also maintaining the rejection, as set forth in the Advisory Action mailed on April 11, 2005, wherein the primary grounds of rejection are the Examiner's position that the invention is obvious in view of Japanese Patent Publication No. JP 11-107112, as previously detailed.

Concerning the foregoing, applicants respectfully take issue with the Examiner's position, noting that the Japanese publication does not in any manner concern itself with the problem which is solved by the present invention, nor does it address itself in any manner to the type of glass cloth weave presented and claimed herein, which prevents collapse of a circuit pad comprising a constituent of a circuit device using large scale circuit pads during process of wire bonding.

In this connection, applicants respectfully submit the following comments in traverse of the rejection of the claims:

Glass cloth is used in the dielectric layers of circuit boards to strengthen the epoxy resin. The resin alone is flimsy and difficult to handle during manufacturing. The cloth adds mechanical strength to aid in handling. As a part of the dielectric layers in the finished board, the cloth reduces the thermal expansion coefficient and thereby reduces the expansion and contraction of the board during thermal cycling (as happens when the board is powered up and down during normal operation).

One of the difficulties of manufacturing circuit boards is controlling expansion and contraction during the actual fabrication process. The many layers of the board go through repeated heating and cooling cycles during lamination, drilling, plating, cleaning etc. Control of this expansion and contraction is critical to ensure that the features on each

layer are aligned with each other and in the correct position for assembly to other components used in the subassembly or final assembly. There is a very exacting science involved with the characteristics of the glass cloth that is designed to control the board dimensions during fabrication. The better board shops use compensation factors at every operation to predict the movement for each process step. They also choose the correct cloth style and weight and the resin loading on the cloth to control the dimension changes. The Japanese patent describes means to control these dimensional changes with proper choice and control of the glass cloth.

The present invention has nothing to do with expansion or contraction or dimensional control, but rather is concerned with collapse of a pad on the surface of a board during a wire bonding process. These surface pads are on the surface of the epoxy / glass dielectric layer. During the wire bonding operation a wire is fused (welded) to the pad by applying pressure and energy (usually ultrasonic vibration). If the epoxy/glass layer is not strong enough it can collapse during the wire bonding operation and the bond is not formed correctly. What has been ascertained through our experiments is that the epoxy / cloth in which the cloth has a very loose weave, i.e, filaments relatively far apart, was more prone to collapse than when the glass cloth had a tight weave, i.e. the filaments are very close together. The epoxy/glass dielectric material with the tight weave glass cloth provided a much stronger base under the pad and there was no pad collapse encountered during wire bonding.

The foregoing inventive aspects have now been clearly set forth and clarified in the claims, and wherein the wire mesh size employed herein, which is not at all disclosed in the Japanese publication, is of critical importance, as also set forth in the present claims, and is adapted to prevent collapse of circuit pads during the wire bonding process.

In no manner is the Japanese structure capable of accomplishing the foregoing, nor does it address itself in any manner to the present problem, which is solved by the glass cloth structure, pursuant to the invention, as particularly elucidated in the claims.

Accordingly, in view of the foregoing comments and amendments, which also eliminate the objectionable terminology in the independent claims by setting forth that the mesh of the specific size is constituted of fiberglass, thereby avoiding any ambiguities in the language of the claims, clearly distinguishes in a patentable manner over the Japanese publication and any other art which is known to the applicants or which has been referred to by the Examiner.

In view of the foregoing comments and amendments being presented herewith, this application is clearly deemed to be in condition for allowance and the early issuance of the Notice of Allowance by the Examiner is earnestly solicited.

However, in the event that the Examiner has any queries concerning the instantly submitted Amendment, applicants' attorney respectfully requests that he be accorded the courtesy of possibly a telephone conference to discuss any matters in need of attention.

Respectfully submitted,



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